

8.7 Noise

This section presents an assessment of potential noise effects related to the Walnut Creek Energy Park (WCEP). Section 8.7.1 discusses the fundamentals of acoustics. Section 8.7.2 describes the affected environment, including baseline noise level survey methodology and results. Section 8.7.3 discusses the environmental consequences from construction and operation of the power plant and associated facilities. Section 8.7.4 discusses cumulative impacts. Section 8.7.5 discusses mitigation measures. Section 8.7.6 presents applicable laws, ordinances, regulations, and standards (LORS). Section 8.7.7 presents agency contacts, and Section 8.7.8 presents permit requirements and schedules. Section 8.7.9 contains references.

8.7.1 Fundamentals of Acoustics

Acoustics is the study of sound, and noise is defined as unwanted sound. Airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure creating a sound wave. Acoustical terms used in this section are summarized in Table 8.7-1.

The most common metric is the overall A-weighted sound level measurement that has been adopted by regulatory bodies worldwide. The A-weighting network measures sound in a similar fashion to the way in which a person perceives or hears sound. In this way, it provides a good measure for evaluating acceptable and unacceptable sound levels.

A-weighted sound levels are typically measured or presented as equivalent sound pressure level (L_{eq}), which is defined as the average noise level, on an equal energy basis for a stated period of time, and is commonly used to measure steady state sound or noise that is usually dominant. Statistical methods are used to capture the dynamics of a changing acoustical environment. Statistical measurements are typically denoted by L_{xx} , where xx represents the percentile of time the sound level is exceeded. The L_{90} is a measurement that represents the noise level that is exceeded during 90 percent of the measurement period. Similarly, the L_{10} represents the noise level exceeded for 10 percent of the measurement period.

Some metrics used in determining the impact of environmental noise consider the differences in response that people have to daytime and nighttime noise levels. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes more noticeable. Furthermore, most people sleep at night and are sensitive to intrusive noises. To account for human sensitivity to nighttime noise levels, the Day-Night Sound Level (L_{dn} or DNL) was developed. L_{dn} is a noise index that accounts for the greater annoyance of noise during the nighttime hours.

L_{dn} values are calculated by averaging hourly L_{eq} sound levels for a 24-hour period, and apply a weighting factor to nighttime L_{eq} values. The weighting factor, which reflects the increased sensitivity to noise during nighttime hours, is added to each hourly L_{eq} sound level before the 24-hour L_{dn} is calculated. For the purposes of assessing noise, the 24-hour day is divided into two time periods, with the following weightings:

- Daytime: 7 a.m. to 10 p.m. (15 hours) Weighting factor of 0 dB
- Nighttime: 10 p.m. to 7 a.m. (9 hours) Weighting factor of 10 dB

TABLE 8.7-1
Definitions of Acoustical Terms

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise or sound at a given location. The ambient level is typically defined by the L_{eq} level.
Background Noise Level	The underlying ever-present lower level noise that remains in the absence of intrusive or intermittent sounds. Distant sources, such as traffic, typically make up the background. The background level is generally defined by the L_{90} percentile noise level.
Intrusive	Noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, tonal content, the prevailing ambient noise level as well as the sensitivity of the receiver. The intrusive level is generally defined by the L_{10} percentile noise level.
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
A-Weighted Sound Level (dBA)	The sound level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Equivalent Noise Level (L_{eq})	The average A-weighted noise level, on an equal energy basis, during the measurement period.
Percentile Noise Level (L_n)	The noise level exceeded during n percent of the measurement period, where n is a number between 0 and 100 (e.g., L_{90})
Day-Night Noise Level (L_{dn} or DNL)	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels from 10:00 p.m. to 7:00 a.m.

The two time periods are then averaged to compute the overall L_{dn} value. For a continuous noise source, the L_{dn} value is easily computed by adding 6.4 dB to the overall 24-hour noise level (L_{eq}). For example, if the expected continuous noise level from the power plant was 60.0 dBA, the resulting L_{dn} from the plant would be 66.4 dBA.

The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction
- Interference with activities such as speech, sleep, learning
- Physiological effects such as startling and hearing loss

In most cases, environmental noise produces effects in the first two categories only. However, workers in industrial plants may experience noise effects in the last category. No completely satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is primarily due to the wide variation in individual thresholds of annoyance and habituation to noise. Thus, an important way of determining a person's subjective reaction to a new noise is by comparing it to the existing or "ambient" environment to which that

person has adapted. In general, the more the level or the tonal (frequency) variations of a noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

Table 8.7-2 shows the relative A-weighted noise levels of common sounds measured in the environment and in industry for various sound levels.

TABLE 8.7-2
Typical Sound Levels Measured in the Environment and Industry

Noise Source at a Given Distance	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
Shotgun (at shooter's ear)	140	Carrier flight deck	Painfully loud
Civil defense siren (100 ft)	130		
Jet takeoff (200 ft)	120		Threshold of pain
Loud rock music	110	Rock music concert	
Pile driver (50 ft)	100		Very loud
Ambulance siren (100 ft)	90	Boiler room	
Pneumatic drill (50 ft)	80	Noisy restaurant	
Busy traffic; hair dryer	70		Moderately loud
Normal conversation (5 ft)	60	Data processing center	
Light traffic (100 ft); rainfall	50	Private business office	
Bird calls (distant)	40	Average living room library	Quiet
Soft whisper (5 ft); rustling leaves	30	Quiet bedroom	
	20	Recording studio	
Normal breathing	10		Threshold of hearing

Source: Beranek, 1998.

8.7.2 Affected Environment

8.7.2.1 Local Land Use and Noise Sources

The WCEP site is located within a densely developed industrial area within the City of Industry approximately 12 miles east of downtown Los Angeles. The project site lies within an industrial park that is occupied by a warehouse and a truck parking lot. To the west of the western end of the project parcel is a small fenced area containing a drainage channel and some natural vegetation. Further west of the project site, land uses include an electrical transmission line easement, the Southern California Edison (SCE) Walnut Substation, and an ornamental landscape nursery (which occupies a portion of the transmission easement). To the east of the eastern end of the project parcel is Bixby Drive. To the south and east of the project site are industrial land uses (large tilt-up warehouses). Hacienda Heights, an unincorporated area within Los Angeles County that includes primarily residential land uses, is located further south of the project site. To the north of the site are a 230 and 66 kV transmission line corridor, the flood control channel of San Jose Creek, and a large intermodal rail yard. Further north is a primarily residential area within the City of La Puente. Figure 8.6-1 in Section 8.6, Land Use, depicts existing land uses within a one-mile radius of the project site.

Sources of environmental noise in the project area are primarily transportation-related. These include State Route 60 (the Pomona Freeway), Gale Avenue, the Union Pacific Railway immediately south of the site, and the Southern Pacific intermodal rail yard, north of the project site.

8.7.2.2 Ambient Noise Survey

Walnut Creek Energy, LLC (Applicant) conducted continuous ambient noise monitoring to determine the level of noise in the project area. There were two monitoring events and four monitoring locations (Figure 8.7-1), as follows:

- M1 – This location is within the boundaries of the project site at a point closest to the nearest residential receptor. This location was monitored continuously for approximately from 4:45 p.m. on September 7 through 7:00 a.m. on September 9, including the 25-hour span between 6:00 p.m. on September 7 and 7:00 p.m. on September 8 that is used in the comparison tables.
- M2 – This monitoring location is near the corner of Folger Street and Fieldgate Avenue in Hacienda Heights, approximately 1,130 feet south of the project site. It was chosen to represent the ambient noise levels at the nearest residential receptor to the project. This location was monitored for 20 minutes during the night (3:30 a.m.) on September 8 and for the 25-hour span from 6:00 p.m. on November 2 to 6:00 p.m. on November 2 to 6:00 p.m. on November 3.
- M3 – This location is the Glenelder Elementary School on Folger Street between Hinnen and Glenelder Avenues, about 1,720 feet from the project site. It was monitored over six nighttime hours (22:12 to 03:42) on September 8 as a second location to represent the nearest residential area south of the project site.
- M4 – This location is near the corner of Inyo Street and Roxham Avenue in La Puente, approximately 1,720 feet north-northwest of the project site. This site was chosen as to represent the nearest residential receptor north of the project site. It was monitored for the 25-hour span from 6:00 p.m. on November 2 to 6:00 p.m. on November 2 to 6:00 p.m. on November 3.

Monitoring equipment included Larson Davis 820 ANSI Type 1 (precision), statistical sound level meters were used to conduct continuous the measurements. The sound level meters were field calibrated before and after the measurement with a Larson Davis CAL200 and were factory calibrated within the previous 12 months.

During the first monitoring event, on September 7 through 9, clear skies and a light breeze (generally less than 10 mph at the microphone) persisted throughout most of the measurement period. At the start of the measurement period, the temperature was approximately 70 °F and the humidity was 60 percent. At the end of the measurement period, the temperature was approximately 60°F and humidity was 60 percent, with cloudy skies. During the second monitoring event, on November 2 and 3, skies were cloudy, temperature was approximately 50 °F and winds were calm. Tables 8.7-3 through 8.7-5 and Appendix 8.7 present the monitoring results.

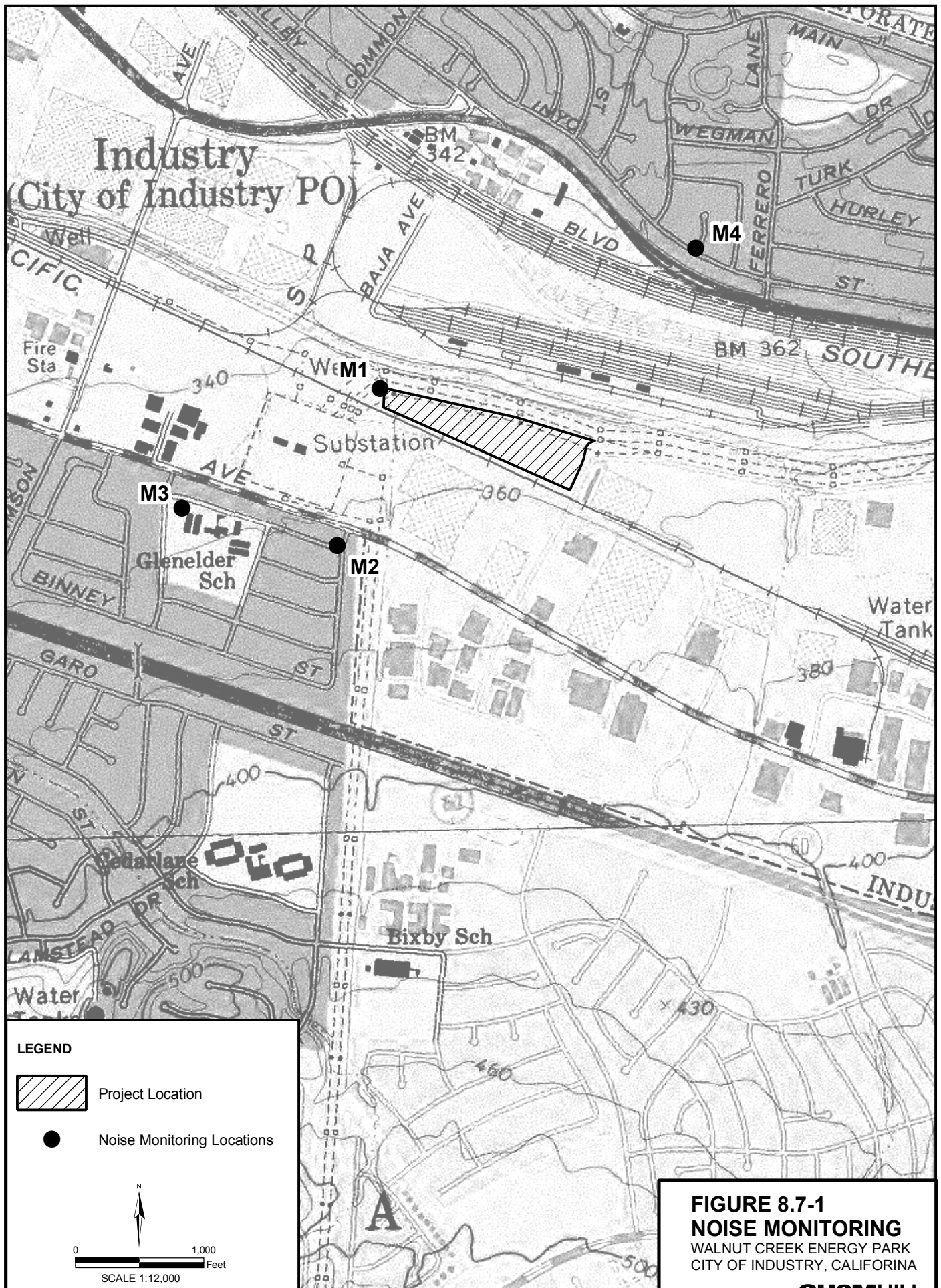


TABLE 8.7-3
Summary of Hourly Sound Levels at Residential Receptors

Location M1 911 Bixby Drive						Location M2 Fieldgate Avenue and Folger Street					Location M4 Inyo Street and Roxham Avenue				
Dist.	On-site					1,130 feet (0.21 miles)					1,725 feet (0.33 miles)				
Hour	Date	Leq	L10	L50	L90	Date	Leq	L10	L50	L90	Date	Leq	L10	L50	L90
1800	7-Sep-05	68	61	52	50	2-Nov-05	63	65	55	52	2-Nov-05	61	66	56	53
1900	7-Sep-05	70	61	53	51	2-Nov-05	65	62	56	52	2-Nov-05	61	64	55	51
2000	7-Sep-05	64	59	52	50	2-Nov-05	58	59	54	51	2-Nov-05	59	61	52	48
2100	7-Sep-05	61	62	54	52	2-Nov-05	56	58	54	51	2-Nov-05	56	57	50	46
2200	7-Sep-05	62	56	51	49	2-Nov-05	54	57	52	48	2-Nov-05	57	60	50	46
2300	7-Sep-05	70	58	53	51	2-Nov-05	54	57	51	48	2-Nov-05	53	55	49	45
0000	8-Sep-05	64	62	56	52	3-Nov-05	54	55	49	46	3-Nov-05	53	56	49	44
0100	8-Sep-05	62	62	53	50	3-Nov-05	53	55	51	46	3-Nov-05	50	53	47	43
0200	8-Sep-05	70	63	53	51	3-Nov-05	50	52	46	43	3-Nov-05	54	55	48	44
0300	8-Sep-05	71	63	52	50	3-Nov-05	52	52	46	44	3-Nov-05	56	54	46	42
0400	8-Sep-05	57	55	53	51	3-Nov-05	49	52	46	43	3-Nov-05	57	59	50	46
0500	8-Sep-05	55	56	53	51	3-Nov-05	51	55	49	47	3-Nov-05	59	64	53	49
0600	8-Sep-05	57	58	52	50	3-Nov-05	57	59	53	49	3-Nov-05	61	65	55	52
0700	8-Sep-05	61	56	51	49	3-Nov-05	57	61	56	50	3-Nov-05	62	67	56	52
0800	8-Sep-05	69	58	52	48	3-Nov-05	60	62	57	52	3-Nov-05	61	65	55	51
0900	8-Sep-05	54	55	51	49	3-Nov-05	59	62	56	52	3-Nov-05	59	62	53	50
1000	8-Sep-05	70	54	51	49	3-Nov-05	57	60	55	51	3-Nov-05	60	64	54	51
1100	8-Sep-05	54	55	51	49	3-Nov-05	60	61	56	53	3-Nov-05	61	63	54	51
1200	8-Sep-05	63	59	52	49	3-Nov-05	68	61	56	53	3-Nov-05	60	64	54	50
1300	8-Sep-05	60	65	53	51	3-Nov-05	60	61	56	54	3-Nov-05	60	64	55	51
1400	8-Sep-05	63	58	53	52	3-Nov-05	60	61	56	53	3-Nov-05	61	66	55	52
1500	8-Sep-05	57	57	54	52	3-Nov-05	60	60	56	53	3-Nov-05	62	66	57	52
1600	8-Sep-05	65	60	55	53	3-Nov-05	59	62	56	53	3-Nov-05	62	67	58	55
1700	8-Sep-05	65	61	55	53	3-Nov-05	59	61	57	54	3-Nov-05	61	66	57	54
1800	8-Sep-05	56	57	53	51	3-Nov-05	57	60	55	52	3-Nov-05	61	66	57	53
Leq		66					60					59			
Ldn		73					62					64			
CNEL		73					63					64			
24-hr average		63	59	53	51		57	59	53	50		59	62	53	49
Nighttime average*		63	59	53	51		53	55	49	46		56	58	50	46

* Nighttime hours are **bold**.

TABLE 8.7-4

Summary of Attended Measurement at Folger Street and Fieldgate Avenue (M2) on September 8 (dBA)

Date & Time	Duration	L _{eq}	L ₅₀	L ₉₀
9/8/05 03:33	20 minutes	54	52	50

TABLE 8.7-5

Summary of Continuous Measurements at the Glenelder Elementary School (M3) (dBA)

Date & Time	L _{eq}	L ₅₀	L ₉₀	Date & Time	L _{eq}	L ₅₀	L ₉₀
9/8/05 22:12	56	54	52	9/9/05 1:42	55	53	50
9/8/05 22:42	54	53	51	9/9/05 2:42	51	51	47
9/8/05 23:42	53	52	49	9/9/05 3:42	52	50	48
9/9/05 0:42	52	51	48				

8.7.3 Environmental Consequences

The proposed WCEP will produce noticeable noise but the noise levels will be in compliance with City of Industry's goals for industrial properties. Noise will also be produced at the site during the construction phase of the project. Potential noise impacts from construction and operation activities are assessed in this section.

8.7.3.1 Significance Criteria

Following the California Environmental Quality Act (CEQA) guidelines (California Code of Regulations, Title 14, Appendix G, Section XI), the project would cause a significant impact if it would result in the following:

- Exposure of people to noise levels in excess of standards established in the local General Plan or noise ordinance
- Exposure of people to excessive ground-borne noise levels or vibration
- Substantial permanent increase in ambient noise levels in the project vicinity
- Substantial temporary or periodic increase in ambient noise levels in the project vicinity

Generally, the design basis for noise control is the minimum, or most stringent, noise level required by any of the applicable LORS. Therefore, noise from this project is evaluated against the City of Industry's requirements. The City of Industry has not established quantitative standards for determining appropriate noise levels for various zoning districts. Rather, the General Plan goals strive for uses that are compatible with adjacent communities.

The California Energy Commission (CEC) Staff has stated that increases in background noise lower than 5 dBA at a sensitive receptor are clearly not adverse or significant and increases in background noise above 10 dBA at a sensitive receptor are clearly significant

and adverse and that increases in background noise between 5 and 10 dBA may or may not be significant, depending on the circumstances (CEC, 2002).

The CEC Staff has also stated that construction noise is typically insignificant if (1) the construction activity is temporary, (2) use of heavy equipment and noisy activities is limited to daytime hours, and (3) all feasible noise abatement measures are implemented for noise-producing equipment (CEC, 2002).

8.7.3.2 Construction Impacts

8.7.3.2.1 Plant Construction Noise

Construction of the WCEP is expected to be typical of other power plants in terms of schedule, equipment used, and other types of activities. The noise level will vary during the construction period, depending upon the construction phase. Construction of power plants can generally be divided into five phases that use different types of construction equipment. The five phases are (1) demolition, site preparation, and excavation; (2) concrete pouring; (3) steel erection; (4) mechanical; and (5) clean-up (Miller et al., 1978).

Both the USEPA Office of Noise Abatement and Control and the Empire State Electric Energy Research Company have extensively studied noise from individual pieces of construction equipment as well as from construction sites of power plants and other types of facilities (USEPA, 1971; Barnes et al., 1976). Because specific information on types, quantities, and operating schedules of construction equipment is not available at this point in project development, information from these documents for similarly sized industrial projects will be used. Use of this data, which is between 21 and 26 years old, is conservative because the evolution of construction equipment has been toward quieter designs to protect operators from exposure to high noise levels.

The loudest equipment types generally operating at a site during each phase of construction are presented in Table 8.7-6. The composite average or equivalent site noise level, representing noise from all equipment, is also presented in the table for each phase.

TABLE 8.7-6
Construction Equipment and Composite Site Noise Levels

Construction Phase	Loudest Construction Equipment	Equipment Noise Level (dBA) at 50 feet	Composite Site Noise Level (dBA) at 50 feet
Demolition, Site Clearing, and Excavation	Dump Truck	91	89
	Backhoe	85	
Concrete Pouring	Truck	91	78
	Concrete Mixer	85	
Steel Erection	Derrick Crane	88	87
	Jack Hammer	88	
Mechanical	Derrick Crane	88	87
	Pneumatic Tools	86	
Cleanup	Rock Drill	98	89
	Truck	91	

Source: USEPA, 1971; Barnes et al., 1976.

Average or equivalent construction noise levels projected at various distances from the site are presented in Table 8.7-7. These results are conservative because the only attenuating mechanism considered was divergence of the sound waves in open air. Shielding effects of intervening structures are not included in the calculations. The construction noise may be audible at the nearest dwelling units but is not anticipated to dramatically exceed current exposure levels and the noisiest construction activities will be confined to the daytime hours. Table 8.7-8 presents noise levels from common construction equipment at various distances.

TABLE 8.7-7
Average Construction Noise Levels at Various Distances

Construction Phase	Sound Pressure Level (dBA)		
	375 feet	1,500 feet	3,000 feet
Demolition, Site Clearing, and Excavation	71	59	53
Concrete Pouring	60	48	42
Steel Erection	69	57	51
Mechanical	69	57	51
Clean-Up	71	59	53

TABLE 8.7-8
Noise Levels from Common Construction Equipment at Various Distances

Construction Equipment	Typical Sound Pressure Level at 50 feet (dBA)	Typical Sound Pressure Level at 375 feet (dBA)	Typical Sound Pressure Level at 1,500 feet (dBA)
Pile Drivers (20,000-32,000 ft-lbs./blow)	104	86	74
Dozer (250-700 hp)	88	70	58
Front End Loader (6-15 cu. yds.)	88	70	58
Trucks (200-400 hp)	86	68	56
Grader (13 to 16 ft. blade)	85	67	55
Shovels (2-5 cu. yds.)	84	66	54
Portable Generators (50-200 kW)	84	66	54
Derrick Crane (11-20 tons)	83	65	53
Mobile Crane (11-20 tons)	83	65	53
Concrete Pumps (30-150 cu. yds.)	81	63	51
Tractor (3/4 to 2 cu. yds.)	80	62	50
Unquieted Paving Breaker	80	62	50
Quieted Paving Breaker	73	55	43

Noise generated during the testing and commissioning phase of the project is not expected to be substantially different from that produced during normal full-load operation. Starts and abrupt stops are more frequent during this period, but on the whole they are usually short-lived.

8.7.3.2.2 Construction Vibration

Construction vibrations can be divided into three classes, based on the wave form and its source (see Table 8.7-9). It will be limited to normal construction hours (during the daytime) and will be of short duration; therefore, no mitigation is required.

TABLE 8.7-9
Construction Vibrations

Wave Form	Example Source
Impact	Impact pile driver or blasting
Steady state	Vibratory pile driver
Pseudo steady state	Double acting pile hammer

8.7.3.2.3 Worker Exposure to Noise

Worker exposure levels during construction of the WCEP will vary depending on the phase of the project and the proximity of the workers to the noise-generating activities. Construction noise is potentially harmful to the health and hearing of construction workers. This potentially significant impact will be reduced to a level below significance by preparation and execution of a Hearing Protection Plan, which complies with Cal-OSHA requirements. This Hearing Protection Plan will be incorporated into the project construction Health and Safety Plan. The plan will require hearing protection for workers and visitors throughout the duration of the construction period.

8.7.3.3 Operational Impacts

8.7.3.3.1 Worker Exposure

Nearly all components will be specified not to exceed near-field maximum noise levels of 90 dBA at 3 feet (or 85 dBA at 3 feet where available as a vendor standard). Because no permanent or semi-permanent workstations are located near any piece of noisy plant equipment, no worker's time-weighted average exposure to noise should approach the level allowable under Cal-OSHA guidelines. Nevertheless, signs requiring the use of hearing protection devices will be posted in all areas where noise levels commonly exceed 85 dBA, such as inside acoustical enclosures. Outdoor levels throughout the plant will typically range from 90 dBA near certain equipment to roughly 65 dBA in areas more distant from any major noise source.

8.7.3.3.2 Transmission Line and Switchyard Noise Levels

One of the electrical effects of high-voltage transmission lines is corona. Corona is the ionization of the air that occurs at the surface of the energized conductor and suspension hardware due to very high electric field strength at the surface of the metal during certain conditions. Corona may result in radio and television reception interference, audible noise,

light, and production of ozone. Corona is generally a principle concern with transmission lines of 345 kV and higher. Noise is also generally associated with foul weather conditions. Because the transmission line is 230 kV, corona noise is not anticipated to be significant.

8.7.3.3.3 Plant Operational Noise Levels

A noise model of the proposed WCEP facility has been developed using source input levels derived from manufacturers' data and field surveys of similar equipment. The noise emissions from the plant have been calculated at the residential receptors of potential concern. The noise levels presented represent the anticipated steady-state level from the plant with essentially all equipment operating.

Standard acoustical engineering methods were used in the noise analysis. The computer software noise model, CADNA/A by DataKustik GmbH of Munich, Germany is very sophisticated and enables one to fully model very complex industrial plants. The sound propagation factors used in the model have been adopted from ISO 9613-2 *Acoustics – Attenuation of Sound During Propagation Outdoors* (International Organization for Standardization, 1996) and VDI 2714 *Outdoor Sound Propagation*. The model divides the proposed facility into a list of individual point and area noise sources representing each piece of equipment that produces a significant amount of noise. The sound power levels representing the standard performance of each of these components are assigned based either on field measurements of similar equipment made at other existing plants, data supplied by manufacturers, or information found in the technical literature. Using these standard power levels as a basis, the model calculates the sound pressure level that would occur at each receptor from each source after losses from distance, air absorption, blockages, etc. are considered. The sum of all these individual levels is the total plant level at the modeling point.

The sound power levels used in the model are summarized in Table 8.7-10, by octave band. Because the GE Energy LMS100 turbine is new, this data is considered preliminary. With noise attenuation measures incorporated into the project design, noise attributable to the project is predicted not to exceed 52 dBA at the closest residentially zoned receptor, located near the corner of Gale and Fieldgate Avenues, near noise monitoring location M2. This is less than the existing 24-hour average L_{50} of 53 dBA as measured at M2. This is also equivalent to an L_{dn} of 58, compared with the existing L_{dn} level of 62 dBA at residential receptor M2.

TABLE 8.7-10
Octave Band Sound Power Levels Used to Model WCEP Operations, dB (Flat)

Plant Component	Octave Band Center Frequency, Hz									dBA
	31.5	63	125	250	500	1k	2k	4k	8k	
Stacks	115	112	108	104	98	93	95	96	96	104
LMS100 Combustion Turbine Generators (CTG)	123	121	118	109	103	100	99	105	99	110
Cooling Tower	114	115	115	111	108	106	102	103	101	112
Fuel Gas Compressors	115	116	112	109	110	111	109	109	108	105
Gas Cooler	107	111	107	98	99	93	99	103	101	107
Transformers	108	111	105	105	100	94	91	88	88	102
SCR Duct Walls	117	116	118	111	104	99	94	84	72	108

Nighttime operation of WCEP, while it may occur, will be relatively rare. As a peaking power facility, the project's annual capacity factor will range between 20 to 40 percent, and the most common times of operation will be afternoons during hot weather episodes.

Several design elements will be necessary to control noise emissions and will be used to meet the project noise limits. Potential noise control measures include:

- Increasing combustion turbine air inlet and ventilation silencing
- Additional noise barriers around combustion turbine enclosure
- Increasing stack silencing
- Increasing thickness of SCR plate steel
- Additional noise barriers around SCR inlet and expansion joint
- Low noise, slow speed cooling tower fan and motors
- Cooling tower noise barriers and/or splash noise attenuators
- Additional cooling tower noise barriers
- Silencers and/or enclosures on auxiliary equipment

8.7.3.3.4 Tonal Noise

At the monitoring locations modeled here, no significant tones are anticipated. That is not to say that audible tones are impossible—certain sources within the plant such as the combustion turbine inlets, transformers, pump motors, cooling tower fan gearboxes, etc. have been known to sometimes produce significant tones. It is WCEC's intention to anticipate the potential for audible tones in the design and specification of the plant's equipment and take necessary steps to prevent sources from emitting tones that might be disturbing at the nearest receptors.

8.7.3.3.5 Ground and Airborne Vibration

Combustion turbine generator facilities using the similar LM6000 machine have not resulted in ground or airborne vibration impacts and it is not anticipated that GE Energy's LMS100 technology would differ greatly in its ability to create ground or airborne vibrations. The proposed project is driven by gas turbines exhausting into a selective catalytic reduction (SCR) duct and a stack silencer. These very large ducts reduce low frequency noise, which is mainly the source of airborne induced vibration of structures.

The equipment that would be used in the proposed project is well balanced and is designed to produce very low vibration levels throughout the life of the project. An imbalance could contribute to ground vibration levels in the vicinity of the equipment. However, vibration-monitoring systems installed in the equipment are designed to ensure that the equipment remains balanced. Should an imbalance occur, the event would be detected and the equipment would automatically shut down.

8.7.4 Cumulative Impacts

There is little or no land available for additional development and there are few major new developments planned within the City of Industry within this half-mile area. It is therefore unlikely that the project, combined with other new sources of noise, would cause a significant impact cumulatively.

8.7.5 Mitigation Measures

The Applicant proposes to implement the following mitigation measures.

8.7.5.1 Noise Hot Line

The Applicant shall establish a telephone number for use by the public to report any significant undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

8.7.5.2 Noise Complaint Resolution

Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all legitimate project related noise complaints.

The Applicant or authorized agent shall:

- Use the Noise Complaint Resolution Form typically suggested by CEC or functionally equivalent procedure to document and respond to each noise complaint.
- Attempt to contact the person(s) making the noise complaint within 24 hours.
- Conduct an investigation to attempt to determine the source of noise related to the complaint.
- If the noise complaint is legitimate, take all commercially feasible measures to reduce the noise at its source.

8.7.5.3 Construction Hours

Noisy construction or demolition work (that which causes offsite annoyance as evidenced by the filing of a legitimate noise complaint) shall be restricted to 7 a.m. to 8 p.m.

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

8.7.6 Laws, Ordinances, Regulations, and Standards

The following are the LORS that apply to noise generated by the project. They are summarized in Table 8.7-11.

8.7.6.1 Federal

8.7.6.1.1 USEPA

Guidelines are available from the USEPA (1974) to assist state and local government entities in development of state and local LORS for noise. Because there are local LORS that apply to this project, these guidelines are not applicable.

TABLE 8.7-11
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Purpose
Federal Offsite	
USEPA	Guidelines for state and local governments.
Federal Onsite	
OSHA	Exposure of workers over 8-hour shift limited to 90 dBA.
State Onsite	
Cal/OSHA, 8 CCR Article 105 Sections 095 et seq.	Exposure of workers over 8-hour shift limited to 90 dBA.
State Offsite	
Calif. Vehicle Code Sections 23130 and 23130.5	Regulates vehicle noise limits on California highways.
Local	
California Government Code Section 65302	Requires local government to prepare plans that contain noise provisions.
City of Industry – General Plan	The General Plan provides qualitative compatibility goals and policy.

8.7.6.1.2 OSHA

Onsite noise levels are regulated, in a sense, through the Occupational Safety and Health Act of 1970 (OSHA). The noise exposure level of workers is regulated at 90 dBA, over an 8-hour work shift to protect hearing (29 Code of Federal Regulations [CFR] 1910.95). Onsite noise levels will generally be in the 70- to 85-dBA range. Areas above 85 dBA will be posted as high noise level areas and hearing protection will be required. The power plant will implement a hearing conservation program for applicable employees and maintain exposure levels below 90 dBA.

8.7.6.2 State of California

8.7.6.2.1 Cal-OSHA

The California Department of Industrial Relations, Division of Occupational Safety and Health enforces California Occupational Safety and Health Administration (Cal-OSHA) regulations, which are the same as the federal OSHA regulations described previously. The regulations are contained in Title 8 of the California Code of Regulations (CCR), General Industrial Safety Orders, Article 105, Control of Noise Exposure, Sections 5095, et seq.

8.7.6.2.2 California Vehicle Code

Noise limits for highway vehicles are regulated under the California Vehicle Code, Sections 23130 and 23130.5. The limits are enforceable on the highways by the California Highway Patrol and the County Sheriff Offices.

8.7.6.3 Local

The California State Planning Law (California Government Code Section 65302) requires that all cities, counties, and entities (such as multi-city port authorities) prepare and adopt a General Plan to guide community development. The City of Industry General Plan contains noise goals and policy statements to encourage compatibility with surrounding communities. The applicable General Plan goals are “to maintain a low profile of noise sources so that surrounding communities are not infringed by noises from sources other than transportation” and “to continue proper land use by locating industries generating noises that might be objectionable in compatible areas.”

8.7.7 Involved Agencies and Agency Contacts

Agency contacts relative to noise issues in the three jurisdictions within one mile of the project site are presented in Table 8.7-13.

TABLE 8.7-13
Involved Agencies and Agency Contacts

Agency	Contact/Title	Telephone
City of Industry Planning Department 15651 East Stafford Street City of Industry, CA 91744 http://www.cityofindustry.org	Mike Kissell/Planning Director Troy Helling/Planning Assistant	(626) 333-2211

8.7.8 Permits Required and Permit Schedule

No permits are required; therefore, there is no permit schedule.

8.7.9 References

Barnes, J.D., L.N. Miller, and E.W. Wood. 1976. *Prediction of Noise from Power Plant Construction*. Bolt, Beranek and Newman, Inc. Cambridge, MA. Prepared for the Empire State Electric Energy Research Corporation, Schenectady, NY.

Beranek, L.L. 1998. *Noise and Vibration Control*. Institute of Noise Control Engineering. McGraw Hill.

California Energy Commission. 2002. Final Staff Assessment. Potrero Power Plant Unit 7 Project. Noise. Testimony of Jim Buntin.

International Organization for Standardization. 1996. *Acoustics – Attenuation of Sound During Propagation Outdoors*, Part 2: General method of calculation ISO 9613-2, Geneva, Switzerland.

Miller, L.N., E.W. Wood, R.M. Hoover, A.R. Thompson, and S.L. Thompson, and S.L. Paterson. 1978. *Electric Power Plant Environmental Noise Guide*, Vol. 1. Bolt, Beranek and Newman, Inc. Cambridge, MA. Prepared for the Edison Electric Institute, New York.

OSHA. 1970. Occupational Safety and Health Act of 1970.

United States Code of Federal Regulations Title 29 Part 1910.95.

U.S. Environmental Protection Agency (USEPA). 1971. Noise from Construction Equipment and Operations, US Building Equipment, and Home Appliances. Prepared by Bolt, Beranek and Newman for USEPA Office of Noise Abatement and Control, Washington, DC.

USEPA. 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, EPA-550/9-74-004, EPA. U.S. Environmental Protection Agency (March 1974).